

Serial No.: 10/825,910
Group Art Unit: 2818

REMARKS

Claim Rejections 35 USC § 102

Claims 1-2, 5-7, 10-12, 15-17, and 20 are rejected under 35 U.S.C. 1.02(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Akram (U.S. Patent No. 5,904,497, hereinafter "Akram '497").

Referring to claims 1, 6, 11, and 16, Applicants have clarified these independent claims, as exemplified in claim 1, to include:

"the heat sink comprising a body portion, an undercut portion around its periphery, and a plurality of legs integrally formed with the undercut portion"

The Examiner states:

"However, the reference fails to disclose that the surface plate 18 functions as a heat sink as claimed.

Nevertheless, the surface plate 18 is disclosed as being formed of ceramic or silicon (column 3, lines 54-55) which "have the advantage of a matched coefficient of thermal expansion with the silicon of the die to which it will be attached" and wherein the "[T]hermal matching reduces failures of the die resulting from uneven expansion during thermal cycling" (column 6, lines 44-48). Therefore, it appears that the surface plate 18 functions as a heat sink because it matches the thermal state of the die."

Akram '497 fails to disclose or suggest:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion"

Also, it is respectfully submitted that the Examiner has pointed out that the reference fails to disclose a heat sink. As well known to those having ordinary skill in the art, a heat sink is a structure that has the property of conducting heat away from a source; e.g., a metal. Thermal coefficient of thermal expansion relates to how a material increases or decreases in size upon the application of heat. The surface plate 18 is an insulator; i.e., ceramic or silicon.

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC § 102(e) as not being anticipated by Akram '497 because:

"Anticipation requires the disclosure in a single prior art reference disclosure of each and every element of the claim under consideration." W.L. Gore & Assocs. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed.

Serial No.: 10/825,910
Group Art Unit: 2818

Cir. 1983) (citing *Soundscriber Corp. v. United States*, 360 F.2d 954, 960, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)), *cert. denied*, 469 U.S. 851 (1984). *Carella v. Starlight Archery*, 804 F.2d 135, 138, 231 USPQ 644, 646 (Fed. Cir.), *modified on reh'g*, 1 USPQ 2d 1209 (Fed. Cir. 1986); *RCA Corp. v. Applied Digital Data Sys., Inc.*, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

The Examiner continues:

"Referring to claims 2, 7, 12, and 17, as evident from Fig. 7, the reference further discloses electrically connecting the first die to the substrate uses a number of bonding wires (12) and attaching a heat sink attaches a heat sink that extends laterally over the number of bonding wires."

As explained above, Akram '497 does not disclose a heat sink. Akram '497 also fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Thus, claims 2, 7, 12, and 17 which depend respectively upon independent claims 1, 6, 11, and 16 are allowable under 35 USC §102(e) as not being anticipated by Akram '497 because of *W.L. Gore & Assocs. v. Garlock, Inc.*, *supra*.

The Examiner continues:

"Referring to claims 5 and 15, as evident from Fig. 7, the reference further discloses attaching a heat sink attaches a heat sink that extends laterally beyond the edges of the second die."

As explained above, Akram '497 does not disclose a heat sink. Akram '497 also fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Thus, claims 5 and 15 which depend respectively upon independent claims 1 and 11 are allowable under 35 USC §102(e) as not being anticipated by Akram '497 because of *W.L. Gore & Assocs. v. Garlock, Inc.*, *supra*.

The Examiner continues:

"Referring to claims 10 and 20, the reference further discloses providing a heat sink attaches a heat sink between each adjoining pair of dies in the stack of dies (column 5, lines 57-63)."

Serial No.: 10/825,910
Group Art Unit: 2818

As explained above, Akram '497 does not disclose any heat sinks in Akram column 5, line 57-63. Akram '497 also fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Thus, claims 10 and 20 which depend respectively upon independent claims 6 and 16 are allowable under 35 USC §102(e) as not being anticipated by Akram '497 because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

Furthermore, Akram '497 teaches away from Applicants' invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate.

Since Akram '028 teaches away from Applicants' invention, it is respectfully submitted that there is no teaching or suggestion to combine Akram '028 with any other reference to arrive at Applicants' invention as required by 35 USC §103.

It is respectfully submitted that the now amended claims 1, 6, 11, and 16, and the claims depending therefrom, are now unobvious over Akram '028 taken either singularly or in combination.

The dependent claims 2 and 5 depend from independent claim 1. It is respectfully submitted that claims 2 and 5 are allowable since they contain all the limitations of claim 1 as currently amended and claim non-obvious combinations thereof.

Dependent claims 7 and 10 depend from independent claim 6 and are believed to be allowable since they contain all the limitations set forth in the independent claim 6 from which they depend and claim non-obvious combinations thereof.

Dependent claims 12 and 15 depend from independent claim 11 and are believed to be allowable since they contain all the limitations set forth in the independent claim 11 from which they depend and claim non-obvious combinations thereof.

Dependent claims 17 and 20 depend from independent claim 16 and are believed to be allowable since they contain all the limitations set forth in the independent claim 16 from which they depend and claim non-obvious combinations thereof.

Serial No.: 10/825,910
Group Art Unit: 2818

Accordingly, it is respectfully submitted that claims 1-2, 5-7, 10-12, 15-17, and 20 are allowable under 35 U.S.C. §102 or §103 over Akram '497 taken either singularly or in combination.

Claims 1-2, 5-7, 10-12, 15-17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Akram (U.S. Patent 6,351,028, hereinafter "Akram '028").

Referring to claims 1, 6, 11, and 16, Applicants have clarified these independent claims, as exemplified in claim 1, to include limitations not disclosed in Akram '028 of:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion"

The Examiner states:

"attaching a heat sink (26, column 3, lines 61-67, "transfer of thermal energy or heat from semiconductor devices in contact with or around T-interposer 26") having an undercut around its periphery to the first die."

It is respectfully submitted that Akram '028 fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

The T-interposer of Akram '028 connects only to a first die and does not have integrally formed legs attached to the substrate.

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC §102(b) as not being anticipated by Akram '028 because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

The Examiner continues:

"Referring to claims 2, 7, 12, and 17, as evident from the figures, the reference further discloses electrically connecting the first die to the substrate uses a number of bonding wires (no number) and attaching a heat sink attaches a heat sink that extends laterally over the number of bonding wires."

As explained above, Akram '028 does not disclose a heat sink as currently claimed.

Akram '028 fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Serial No.: 10/825,910
Group Art Unit: 2818

Thus, claims 2, 7, 12, and 17 which depend respectively upon independent claims 1, 6, 11, and 16 are allowable under 35 USC §102(b) as not being anticipated by Akram '497 because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

The Examiner continues:

"Referring to claims 5 and 15, as evident from Figs. 5 and 9, the reference further discloses attaching a heat sink attaches a heat sink that extends laterally beyond the edges of the second die."

As explained above, Akram '028 does not disclose a heat sink as currently claimed. Akram '028 fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Thus, claims 5 and 15 which depend respectively upon independent claims 1 and 11 are allowable under 35 USC §102(b) as not being anticipated by Akram '028 because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

The Examiner continues:

"Referring to claims 10 and 20, as evident from Fig. 7, the reference further discloses providing a heat sink attaches a heat sink between each adjoining pair of dies in the stack of dies."

As explained above, Akram '028 does not disclose a heat sink as currently claimed. Akram '028 fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Thus, claims 10 and 20 which depend respectively upon independent claims 6 and 16 are allowable under 35 USC §102(b) as not being anticipated by Akram '028 because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

Claims 1-2, 5-7, 11-12, and 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Fan (U.S. Patent 6,818,978, hereinafter "Fan").

Referring to claims 1, 6, 11, and 16, Applicants have clarified these independent claims, as exemplified in claim 1, to include limitations not disclosed in Fan of:

Serial No.: 10/825,910
Group Art Unit: 2818

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

The Examiner states:

"Referring to claims 1, 6, 11, and 16, the '978 patent discloses a method of ... attaching a heat sink (40/32, "spacer" and "shield", column 3, lines 28-34, and note that the spacer/shield could be a single-piece T-shaped unitary metal piece - hence would function as and properly labeled a heat sink (column 6, lines 46-50) having an undercut around its periphery to the first die".

Fan fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC §102(e) as not being anticipated by Fan because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

The Examiner continues:

"Referring to claims 2, 7, 12, and 17, as evident from the figure, the reference further discloses electrically connecting the first die to the substrate uses a number of bonding wires (34) and attaching a heat sink attaches a heat sink that extends laterally over the number of bonding wires."

As explained above, Fan does not disclose a heat sink as currently claimed. Fan fails to disclose:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Thus, claims 2, 7, 12, and 17 which depend respectively upon independent claims 1, 6, 11 and 16 are allowable under 35 USC §102(e) as not being anticipated by Fan because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

The Examiner continues:

"Referring to claims 5 and 15, as evident from Fig. 1, the reference further discloses attaching a heat sink attaches a heat sink that extends laterally beyond the edges of the second die."

As explained above, Fan does not disclose a heat sink as currently claimed. Fan fails to disclose:

Serial No.: 10/825,910
Group Art Unit: 2818

“a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion” as exemplified in independent claim 1 as currently amended.

Thus, claims 5 and 15 which depend respectively upon independent claims 1 and 11 are allowable under 35 USC §102(e) as not being anticipated by Fan because of *W.L. Gore & Assocs. v. Garlock, Inc.*, supra.

Claim Rejections - 35 USC §103

Claims 3, 8, 13, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Akram (U.S. Patent 6,351,028, hereinafter “Akram '028”), in view of Chiu et al. (U.S. Patent 6,437,984, hereinafter “Chiu”).

Referring to claims 3, 8, 13, and 18 Applicants have clarified independent claims 1, 6, 11, and 16, as exemplified in claim 1, to include limitations not disclosed in Akram '028 or Chiu of:

“a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion” as exemplified in independent claim 1 as currently amended.

The Examiner states:

“The '028 patent discloses a semiconductor package with stacked dies and a method of assembling and using thereof as claimed and as detailed above for claims 1, 6, 11, and 16, but fails to disclose that the heat sink is electrically grounded. The '984 patent, in disclosing a thermally enhanced chip scale package having a heat sink (114, Fig. 1B), teaches that the heat sink may be wire bonded to a ground connection to provide the packaged integrated circuit with shielding from electrical or electromagnetic interference (column 2, lines 16-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the '028 patent package's heat sink so that the heat sink is electrically grounded using wire bonding. One would have been motivated to make such a modification in view of the teachings by the '984 patent that ground connection using wire bonding provide the packaged integrated circuit with shielding from electrical or electromagnetic interference.”

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC §103(a) as not being obvious over Akram '028 in view of Chiu because Akram '028 teaches away from Applicants invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate.

Serial No.: 10/825,910
Group Art Unit: 2818

Chiu also teaches away from Applicants invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate.

Since both Akram '028 and Chiu teach away from Applicants' invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants' invention as required by 35 USC §103.

It is respectfully submitted that the now amended claims 1, 6, 11, and 16, and the claims depending therefrom, are now unobvious over Akram '028 in view of Chiu taken either singularly or in combination.

The dependent claims 3, 8, 13, and 18 respectively depend from independent claims 1, 6, 11, and 16 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

Claims 4, 9, 14, and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Akram '028, in view of Chiu, and further in view of Shin (U.S. Patent 5,854,511, hereinafter "Shin").

Referring to claims 4, 9, 14, and 19 Applicants have clarified independent claims 1, 6, 11, and 16, as exemplified in claim 1, to include limitations not disclosed in Akram '028, Chiu, or Shin of:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

The Examiner states:

"The '028 patent discloses a semiconductor package with stacked dies and a method of assembling and using thereof as claimed and as detailed above for claims 1, 6, 11, and 16, but fails to disclose that the heat sink is electrically grounded and thus further fails to disclose that the heat sink as an electrically conductive coating connected to a ground plane on the substrate.

However, as detailed above, one of ordinary skill in the art at the time the invention was made would include bonding wire grounding to the substrate to shield the package from electrical or electromagnetic interference.

Nevertheless, even with this modification, the heat sink of the modified package lacks an electrically conductive coating and thus lacks an electrically conductive coating connected to a ground plane on the substrate.

The '511 patent, in disclosing a semiconductor package including a multilayered heat sink, teaches in the Abstract, Figs. 1 and 2, and column 1,

Serial No.: 10/825,910
Group Art Unit: 2818

lines 10-22, that an electrically conductive coating formed of silver or nickel and palladium as part of the heat sink results in an improvement in performance of the finally produced semiconductor package.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the '028 patent modified in view of the '984 patent as detailed above for shielding from electrical or electromagnetic interference such that the heat sink has an electrically conductive coating. One would have been motivated to make such a modification in view of the teachings by the '511 patent that an electrically conductive coating formed of silver or nickel and palladium as part of the heat sink results in an improvement in performance of the finally produced semiconductor package. Thus the final modified package would have a heat sink having an electrically conductive coating connected to a ground plane on the substrate and that the second die would be connected to the electrically conductive coating as the second die is connected to the heat sink which has the electrically conductive coating."

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC §103(a) as not being obvious over Akram '028 in view of Chiu and in further view of Shin because Akram '028 teaches away from Applicants invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate. Chiu also teaches away from Applicants' invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate. Shin also teaches away from Applicants' invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate.

Since each of Akram '028, Chiu, and Shin teach away from Applicants' invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants' invention as required by 35 USC §103.

It is respectfully submitted that the now amended claims 1, 6, 11, and 16, and the claims depending therefrom, are now unobvious over Akram '028 in view of Chiu in further view of Shin taken either singularly or in combination.

The dependent claims 4, 9, 14, and 19 respectively depend from independent claims 1, 6, 11, and 16 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

Serial No.: 10/825,910
Group Art Unit: 2818

Claims 3, 8, 13, and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fan (U.S. Patent 6,818,978, hereinafter "Fan"), in view of Chiu.

Referring to claims 3, 8, 13, and 18 Applicants have clarified independent claims 1, 6, 11, and 16, as exemplified in claim 1, to include limitations not disclosed in Fan or Chiu of:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

The Examiner states:

"The '978 patent discloses a semiconductor package with stacked dies and a method of assembling and using thereof as claimed and as detailed above for claims 1, 6, 11, and 16, but fails to disclose that the heat sink is electrically grounded. The '984 patent, in disclosing a thermally enhanced chip scale package having a heat sink (114, Fig. 1 B), teaches that the heat sink may be wire bonded to a ground connection to provide the packaged integrated circuit with shielding from electrical or electromagnetic interference (column 2, lines 16-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the '978 patent package's heat sink so that the heat sink is electrically grounded using wire bonding. One would have been motivated to make such a modification in view of the teachings by the '984 patent that ground connection using wire bonding provide the packaged integrated circuit with shielding from electrical or electromagnetic interference."

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC §103(a) as being unobvious over Fan in view of Chiu because Fan teaches away from Applicants invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate. Chiu also teaches away from Applicants invention because there are no undercut portions of the heat sink or legs integrally formed with the undercut portion of the heat sink that are attached to the substrate.

Since each of Fan and Chiu teach away from Applicants' invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants' invention as required by 35 USC §103.

It is respectfully submitted that independent claims 1, 6, 11, and 16, and the claims depending therefrom, are now unobvious over Fan in view of Chiu taken either singularly or in combination.

Serial No.: 10/825,910
Group Art Unit: 2818

The dependent claims 3, 8, 13, and 18 respectively depend from independent claims 1, 6, 11, and 16 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

Claims 4, 9, 14, and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Fan, in view of Chiu, and further in view of Shin.

Referring to claims 4, 9, 14, and 19 Applicants have clarified independent claims 1, 6, 11, and 16, as exemplified in claim 1, to include limitations not disclosed in Fan, Chiu, or Shin of:

“a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion” as exemplified in independent claim 1 as currently amended.

The Examiner states:

“The ‘978 patent discloses a semiconductor package with stacked dies and a method of assembling and using thereof as claimed and as detailed above for claims 1, 6, 11, and 16, but fails to disclose that the heat sink is electrically grounded and thus further fails to disclose that the heat sink has an electrically conductive coating connected to a ground plane on the substrate and consequently the second die fails to be connected to the electrically conductive coating.

However, as detailed above, one of ordinary skill in the art at the time the invention was made would include bonding wire grounding to the substrate to shield the package from electrical or electromagnetic interference.

Nevertheless, even with this modification, the heat sink of the modified package lacks an electrically conductive coating and thus lacks an electrically conductive coating connected to a ground plane on the substrate.

The ‘511 patent, in disclosing a semiconductor package including a multilayered heat sink, teaches in the Abstract, Figs. 1 and 2, and column 1, lines 10-22, that an electrically conductive coating formed of silver or nickel and palladium as part of the heat sink results in an improvement in performance of the finally produced semiconductor package.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the ‘978 patent modified in view of the ‘984 patent as detailed above for shielding from electrical or electromagnetic interference such that the heat sink has an electrically conductive coating. One would have been motivated to make such a modification in view of the teachings by the ‘511 patent that an electrically conductive coating formed of silver or nickel and palladium as part of the heat sink results in an improvement in performance of the finally produced semiconductor package. Thus the final

Serial No.: 10/825,910
Group Art Unit: 2818

modified package would have a heat sink having an electrically conductive coating connected to a ground plane on the substrate and that the second die would be connected to the electrically conductive coating as the second die is connected to the heat sink which has the electrically conductive coating."

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC §103(a) as being unobvious over Fan in view of Chiu in further view of Shin because Fan teaches away from Applicants invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate. Chiu also teaches away from Applicants invention because there are no undercut portions of the heat sink or legs integrally formed with the undercut portion of the heat sink that are attached to the substrate. Shin also teaches away from Applicants invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate.

Since each of Fan, Chiu and Shin teach away from Applicants' invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants' invention as required by 35 USC §103.

It is respectfully submitted that independent claims 1, 6, 11, and 16, and the claims depending therefrom, are now unobvious over Fan in view of Chiu in further view of Shin taken either singularly or in combination.

The dependent claims 4, 9, 14, and 19 respectively depend from independent claims 1, 6, 11, and 16 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

Claims 10 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Fan.

Referring to claims 10 and 20 Applicants have clarified independent claims 1, 6, 11, and 16, as exemplified in claim 1, to include limitations not disclosed in Fan of:

"a heat sink having a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion" as exemplified in independent claim 1 as currently amended.

Serial No.: 10/825,910
Group Art Unit: 2818

The Examiner states:

"The '978 patent discloses a semiconductor package with stacked dies and a method of assembling and using thereof as claimed and as detailed above for claims 6 and 16, but fails to disclose that providing a heat sink attaches a heat sink between each adjoining pair of dies in the stack of dies. In other words, the '978 patent discloses providing a heat sink attaches a heat sink between the only adjoining pair of dies in the stack of dies shown in Fig. 1 rather than providing a heat sink attaches a heat sink between each adjoining pair of dies in the stack of dies. Nevertheless, because the reference also fails to disclose that the pair of dies is the only pair, it would appear that the package could be modified to include more heat sinks and more dies on the depicted pair of dies, a task that one of ordinary skill in the art at the time the invention was made could easily perform and therefore would have been obvious. A package such modified would comprise a heat sink between each adjoining pair of dies in the stack of dies."

Based on the above, it is respectfully submitted that claims 1, 6, 11, and 16 are allowable under 35 USC §103(a) as being unobvious over Fan because Fan teaches away from Applicants invention because there are no legs integrally formed with the undercut portion of the heat sink that are attached to the substrate.

Since Fan teaches away from Applicants' invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants' invention as required by 35 USC §103.

It is respectfully submitted that independent claims 1, 6, 11, and 16, and the claims depending therefrom, are now unobvious over Fan taken either singularly or in combination.

The dependent claims 10 and 20 respectively depend from independent claims 6 and 16 and are believed to be allowable since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1- 20 at an early date is solicited.

Serial No.: 10/825,910
Group Art Unit: 2818

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,



Mikio Ishimaru
Registration No. 27,449

The Law Offices of Mikio Ishimaru
1110 Sunnyvale-Saratoga Rd., Suite A1
Sunnyvale, CA 94087
Telephone: (408) 738-0592
Fax: (408) 738-0881
Date: May 28, 2005